"DEPOSITION OF KING COTTON."

One of our cotemporaries, under the above heading, exults over the decease of "King Cotton," and shouts aloud for his successor "King Wool." In times of public excitement common sense frequently takes aerial flights, and it has done so in this case. Our cotemporary says, respecting cotton :—"We have to provide a substitute, and Providence, which is liberal as well as wise in dispensing its favors, gives us a compensation. Henceforth, if we be wise, wool will replace cotton." It then goes on to advance proof and argument to show that wool can be produced in quantities sufficient to take the place of the cotton we have been accustomed to use. It states that our annual consumption of wool has been about seven pounds per head, and that this may be doubled if not trebled.

We have sought in vain to obtain accurate statistics respecting the annual home consumption of wool, but that of cotton amounts to 308,295,600 lbs. But even if the crop of wool were to be trebled, it would, according to the above standard, only amount to 630,000.000 lbs., which would be a very inadequate supply for the quantity of cotton that has been hitherto required. In the port of Liverpool no less than 1,314,491,392 lbs. of cotton were received in 1860 and only $43,715,472 lbs. of wool. These figures, showing the quantities of cotton and wool that arrived at Liverpool—celebrated for its imports of manufacturers' materials—afford, according to our notion, good comparative data of the two crops all the world over.

The average yield of American ginned cotton to the acre of land has been 252 lbs. It will take eight acres of land devoted to sheep culture to raise the same quantity of wool. The demand for wool has generally exceeded the supply even when cotton was free for sale. We, therefore, consider that those who have stated that wool can be raised in sufficient quantities to supply the place of cotton, have drawn upon their fancy for facts.

We think we can "see through a millstone" just as far as any other person, but we confess our utter inability to offer a sensible prediction as to the future of cotton. We know—because it is self-evident—that if cotton cannot be obtained in sufficient quantities next year, there will be a great demand for some substitute, even if its price be double or treble that formerly paid for cotton. It appears to us that flax is the only material that seems to be capable of supplying this want to a very considerable extent; hence, we have exhorted farmers to make preparations for its cultivation upon an enlarged scale. At the same time, we also urge more devotion to sheep culture, as there will certainly be a full demand for all the wool that can possibly be raised.

A NORTHEAST STORM MOVES AGAINST THE WIND.

Dr. Franklin observed that the northeast storms on the east side of the North American continent usually commence at the southwest and travel against the wind; and the fact of this apparently impossible operation has been confirmed by all subsequent observation. So well established is the law, that since the construction of telegraphs, it has been customary in Washington to arrange out door operations on the telegraphic reports of the weather at the southwest. A northeast storm, commencing in South Carolina usually reaches New York in from 18 to 30 hours, and continues at the same rate to Boston, Portland and Halifax. When telegraphs were first established it was repeatedly suggested that the intelligence which they would furnish of the weather at the southwest would prove a safe guide for the departure of vessels from our harbor, but we are not aware that an organization was ever formed among our merchants for the purpose of procuring this valuable knowledge.

Though it might seem at first sight impossible for a storm to move against the wind, when the fact is fully established it is not difficult to find an explanation. Clouds are formed by the condensation of vapor in the air which is invisible until it is condensed. As the wind comes from the comparatively warm ocean lying to the northeast, it is loaded with vapor which is condensed as soon as the air is cooled down to the dew point. The winds at first blow a long way over the land, reaching the foot of the Alleghany mountains before they become sufficiently cooled to cause the condensation of the vapor which they contain. The reduction of temperature however extends backward into the current, cooling it, and forming cloud and rain. So, though the clouds are constantly moving with the wind, the border of the falling rain is constantly traveling backward against it. It is easy to see that the rate at which it travels will vary with the varying difference between the temperature of the ocean and that of the land.

TRANSFERRING STEEL ENGRAVINGS ON BANK NOTES.

In the course of our business we are in the way of receiving bank bills from all parts of the country, and having observed that the engraving of those made by the National Bank Note Company is of a very superior quality, our attention was thus called to their establishment; and the idea suggested itself that there might be something in the process that would interest our readers. We purpose to describe at this time only the mode of transferring steel engravings.

The portraits and other small pictures which are engraved on bank notes are used on several plates without being reëngraved, and as the engraving of these, in the high style of the art employed, costs some two or three hundred dollars a piece, the process by which they can be transferred from one plate to another saves an enormous expense. Before a window, with the best light which can possibly be obtained, the engraver sits at his bench with his magnifying glass at his eye, and before him a small steel plate about an eighth of an inch in thickness and perhaps two inches square. He has in sight a drawing, say of the head of Washington, which it is his business to copy upon the steel plate, by scratching lines in the plate with a small steel point. The plate is softened by annealing before it is engraved, and is afterward hardened by a process which we will describe at another time. The lines which the engraver makes in the plate are to receive the ink, and he accordingly makes them broad and close together in the dark parts of the picture and omits them entirely in the high lights. This work requires the utmost care and is exceedingly slow, demanding weeks, and even months to engrave a single head; and as the labor is performed by artists who can command high pay, the engravings are very costly.

After the engraving is finished the plate is hardened and the engraving is then transferred to the periphery of a small steel roller. The rollers are two or three inches in diameter, with faces of different widths for engravings of different sizes, and they have holes through their axes about an inch in diameter for mandrels. The plate being hardened, and the temper of the roller being drawn, both are placed in the transferring press. This consists of a massive iron lever about five inches square, the farther end of which is forced up by a second lever with the fulcrum very near one end, by which means the end of the large lever next the workman can be forced down with very great power. The roller is slipped on a mandrel and placed under the lever, with the engraved plate on a platten below it. The platten rests on friction rollers between smooth guides, and when the workman has brought the pressure of the lever upon the mandrel of the roller, he moves the platten many times back and forth, thus rolling the roller repeatedly upon the engraving under great pressure. As the engraved plate is hard while the roller is soft, the metal of the roller is pressed into the grooves of the plate, and a reversed transfer of the engraving is produced. The roller is then hardened, and, by a precisely similar operation, in the same press, the engraving is transferred to the plate from which the bank note is printed. As the second transfer again reverses the engraving, the depressions and elevations on the second plate are the same as on the first.

The National Bank Note Company have large safes filled with these rollers, bearing upon their peripheries the transfers of engravings. The engravings are so costly that the rollers are worth far more than their weight in gold, and they constitute no inconsiderable portion of the capital of the company.

THE aggregate receipts for the six principal lines of railway in France, from January to October, 1861—nine months—amounted to about $59,863,480, which is an increase of more than $6,000,000 over the receipts during the same period of the previous year.

THE SUCCESSORS OF THE URETS.

The words sulphuret, carburet, cyanuret and the others of this class, are now obsolete, having been replaced by sulphide, carbide, cyanide and the others. The editors of the *American Journal of Science and Arts* and a few other writers, in dropping the *uret* supplied its place with *id*, writing carbid, sulphid, &c., and on another page will be found the reasons for this orthography, stated with remarkable clearness by the editor of the *American Journal of Photography*. Some of the principal chemists in the city have represented to us that, as the SCIENTIFIC AMERICAN has by far the largest circulation of any scientific publication in the world, the course that we take will probably decide which termination shall be adopted.

It is a matter of small importance, and it seems to us that it is hardly worth while for the chemists of this country to separate themselves in this matter from those of Germany, France and England. We should like to see not only a common nomenclature but a common thermometer, a common unit of atomic weights, a common system of weights and measures, and as many things as possible in common universally adopted throughout the world of science. In order to do this some must give way, and we are not sorry that Americans have the opportunity to take the lead in the emulation of small sacrifices which is necessary to bring the men of science of all nations upon a common ground. We are in favor, therefore, of retaining the final e, and we think that the editors both of the *American Journal of Science and Arts* and of the *American Journal of Photography* will finally approve of our decision.

Death of an Eminent Patent Lawyer.

The name of Seth P. Staples has been familiar to us for many years, but in announcing his death we are somewhat surprised to find that he had attained to so great an age. He was born in Canterbury, Conn., Sept. 1, 1776. His father, the Rev. John Staples, was a lineal descendant of Miles Standish of the Plymouth Colony. He entered Yale College in 1794, and, on graduating in 1797, received an honorable appointment, and immediately afterward commenced the study of law, and was admitted to the bar at Litchfield, Conn., in 1799. He practiced with considerable success in that State, where he founded the Law School connected with Yale College. In the commencement of his legal career, he was elected a member of the Connecticut Academy of Arts and Sciences, and subsequently was representative in the State Legislature for seven or eight sessions, and retired from political life in 1816. He afterward removed to New York city, where he attained the summit of his profession, first as a commercial solicitor, and then as a lawyer in patent cases. He was at one time the leading counsel in this class of cases and was connected with the Goodyear India Rubber suits, the Tathan Lead Pipe cases, the Wilder and Herring Safe litigation and many others. He was considered an able and upright lawyer.

Railways of Great Britain.

From two Parliamentary returns just issued, it appears that the aggregate number of miles of railway open for traffic in the United Kingdom at the end of 1860, was 10,433, against 10,002 miles at the end of 1859. The total number of passengers conveyed on those railways in the year 1860 was 163,485,678, against 149,757,294 in the year 1859, showing an increase of 13,678,384. The total traffic receipts for the year 1860 amounted to £27,766,622, against £25,743,502 in the year 1859, showing an increase of £2,023,120.

The total working expenditure amounted to £13,187,368, or 47 per cent of the receipts. There were £14,579,254 for the year applicable to the purposes of interest and dividend on the loan and share capital of the various Railway Companies of the United Kingdom. Of the total working expenditure 18.48 per cent was for the maintenance of the permanent way: 28.83 per cent for locomotive power; 8.49 per cent, for repairs and renewals of carriages and wagons; 22.05 per cent for traffic charges; 3.93 per cent for rates and taxes; 2.75 per cent for government duty; 1.37 per cent for compensation for accidents and losses; 8.10 per cent for miscellaneous expenses; making the total working expenditure as above stated. The total income was about $188,833,000,